CLAIMS

What is claimed is:

1. A method of delivering a nucleic acid of interest to a host cell by means of a gene delivery vehicle based on adenoviral material, said method comprising:

delivering, with said gene delivery vehicle, the nucleic acid of interest to the host cell by associating the gene delivery vehicle with a binding site and/or a receptor present on at least one CAR-negative cell, said binding site and/or receptor being a binding site and/or a receptor for adenovirus subgroup D and/or adenovirus subgroup F.

2. A method of delivering a nucleic acid of interest to a CAR-negative cell, said method comprising:

contacting said CAR-negative cell with a gene delivery vehicle comprising:

the nucleic acid of interest and

adenoviral material involved in binding to a host cell, said adenoviral material being from adenovirus subgroup D and/or adenovirus subgroup F.

3. A chimeric gene delivery vehicle based on at least two adenoviruses, wherein a cell recognizing element of said chimeric gene delivery vehicle is based on adenoviral material from adenovirus subgroup D and/or adenovirus subgroup F, which adenoviral material confers the capability of infecting CAR- negative cells.

4. The chimeric gene delivery vehicle of claim 3, wherein said adenoviral material is based on a fiber, penton and/or hexon protein of adenovirus subgroup D and/or adenovirus subgroup F.

5. The chimeric gene delivery vehicle of claim 3 or claim 4, further comprising: an element from adenovirus 35 responsible for at least partially avoiding an immune response against adenovirus 35 in man.

6. The chimeric gene delivery vehicle of any one of claims 3-5, comprising an adenoviral 16 element or a functional analogue thereof, said adenoviral 16 element conferring adenovirus 16 with an enhanced capability to infect smooth muscle cells and/or synoviocytes.

7. The chimeric gene delivery vehicle of any one of claims 3-6, further comprising adenoviral nucleic acid.

8. The chimeric gene delivery vehicle of any one of claims 3-7, further comprising adenoviral nucleic acid derived from at least two different adenoviral types.

9. The chimeric gene delivery vehicle of claim 7 or claim 8, wherein said adenoviral nucleic acid comprises at least one sequence encoding a capsid protein comprising at least a tissue tropism determining fragment of adenovirus subgroup D and/or adenovirus subgroup F capsid protein.

10. The chimeric gene delivery vehicle of claim 7, claim 8, or claim 9, wherein said adenoviral nucleic acid is modified to reduce or disable the ability of said adenoviral nucleic acid to replicate in a target cell.

11. The chimeric gene delivery vehicle of claim 7, claim 8, claim 9, or claim10, wherein said adenoviral nucleic acid has been modified to reduce or disable the capacity of a host immune system to mount an immune response against adenoviral proteins encoded by said adenoviral nucleic acid.

12. The chimeric gene delivery vehicle of claim 7, claim 8, claim 9, claim10, or claim 11, comprising a minimal adenovirus vector or an integrating adenovirus.

13. The chimeric gene delivery vehicle of any one of the claims 1-12, further comprising at least one non-adenoviral nucleic acid.

14. The chimeric gene delivery vehicle of any one of claims 7-13, wherein said adenoviral nucleic acid is produced by a process comprising:

welding together, through homologous recombination, two nucleic acid molecules comprising partially overlapping sequences wherein said partially overlapping sequences allowing essentially only a single homologous recombination event thus generating a physically linked nucleic acid comprising:

a nucleic acid of interest, at least two functional adenoviral inverted terminal repeats (ITRs), and a functional encapsulation signal, or functional parts, derivatives or analogues of said ITRs and/or encapsulation signal.

15. A cell for producing the chimeric gene delivery vehicle of any one of the claims 3-14, said cell comprising:

first means for assemblying said gene delivery vehicle wherein said first means includes further means for producing of an adenovirus capsid protein, said capsid protein comprising at least a receptor and/or binding site binding fragment of adenovirus subgroup D and/or adenovirus subgroup F capsid protein.

16. The cell of claim 15, wherein said cell is of a PER.C6 cell (ECACC deposit number 96022940) origin.

17. A pharmaceutical composition comprising the chimeric gene delivery vehicle of any one of claims 1 through 14.

18. A receptor and/or a binding site for adenovirus subgroup D and/or adenovirus subgroup F, associated with CAR-negative cells.

19. The receptor and/or a binding site of claim 18, present on K562 cells, amniotic fluid cells and/or primary fibroblast cells.

20. A capsid protein derived from a adenovirus subgroup D and/or adenovirus subgroup F or a functional part, derivative and/or analogue thereof.

21. The capsid protein of claim 20, wherein said capsid protein is a fiber protein.

22. An isolated and/or recombinant nucleic acid encoding a capsid protein of claim 20 or claim 21.

23. The isolated and/or recombinant nucleic acid of claim 22, wherein said isolated and/or recombinant nucleic acid comprises a sequence selected from the group of sequences depicted in Figure 7.